In the Claims:

1-6 (cancelled)

7. (original) A method of manufacturing a photodiode sensor, comprising:

forming a well in a substrate;

forming a shallow trench isolation (STI) element at least partially in the well;

removing a portion of the STI element to form STI regions opposing an exposed portion of the well;

forming a floating node in the exposed portion of the well;

forming a borderless contact buffer layer over at least the floating node and along sidewalls of the STI regions;

forming an interlevel dielectric layer over the borderless contact buffer layer; and

forming a borderless contact extending through the interlevel dielectric layer and the borderless contact buffer layer to the floating node.

8. (original) The method of Claim 7 wherein the borderless contact buffer layer is selected from the group consisting of: SiON, SiN, and combinations thereof.

9. (original) The method of Claim 7 wherein the dielectric layer is selected from the group consisting of: silicon dioxide, low dielectric material, and combinations thereof.

10. (original) The method of Claim 7 wherein a second refractive index of the borderless contact buffer layer is between a first refractive index of the dielectric layer and a third refractive index of the floating node.

11. (original) The method of Claim 7 wherein the dielectric layer has a first refractive index of between about 1.3 and about 1.5, the borderless contact buffer layer has a second refractive index of between about 1.8 and about 2.5, and the floating node has a third refractive index of greater than about 3.

12. (original) The method of Claim 7 wherein the well is doped with an n-type impurity and the floating node is doped with an n+ type impurity.

13. (original) The method of Claim 7 wherein the floating node is formed by implanting ions through an opening between the opposing STI regions.

14. (original) The method of Claim 7 wherein the portion of the STI element is removed by a dry etching process.

15. (original) The method of Claim 7 further comprising forming a conductive interconnect on the dielectric layer and contacting the borderless contact.

16-23 (cancelled).

24. (new) A method of manufacturing a photodiode sensor, comprising the steps of:

forming a doped well in a semiconductor substrate;

forming a shallow trench isolation (STI) element at least partially in the well;

removing a portion of the STI element to form STI regions opposing an exposed portion of the well;

forming a floating node in the exposed portion of the well, the floating node having a refractive index of greater than about 3;

forming a borderless contact buffer layer over at least the floating node and along sidewalls of the STI regions, the borderless contact buffer layer having a refractive index that is less than that of the floating node;

forming an interlevel dielectric layer over the borderless contact buffer layer, the interlevel dielectric layer having a refractive index which is less than the borderless contact buffer layer; and

forming a borderless contact extending through the interlevel dielectric layer and the borderless contact layer to the floating node;

whereby impinging light striking said photodiode sensor will pass through materials with gradually increasing refractive indexes.

25. (new) The method of Claim 24, and further comprising the steps of:

forming the interlevel dielectric to have a refractive index that is greater than about 1.3.

26. (new) The method of Claim 25, and further comprising the steps of:

forming the borderless contact buffer layer to have a refractive index that is greater than about 1.8.

27. (new) The method of Claim 24, and wherein the step of forming the floating node further comprises the steps of:

ion implanting the floating node in the exposed portion in the well to have a doping concentration substantially different from the well.

28. (new) The method of Claim 27, wherein the step of ion implanting the floating node further comprises doping the floating node to a conductivity type opposite to the conductivity type of the well.

29. (new) The method of Claim 27, wherein the step of ion implanting the floating node further comprises doping the floating node to a higher concentration conductivity type of the same conductivity type as that of the well.

30. (new) The method of Claim 28, wherein the step of ion implantation of the floating node results in a p type floating node in an n-type well.

31. (new) The method of Claim 28, wherein the step of ion implantation of the floating node results in an n+ type floating node in an n-type well.

32. (new) A method of manufacturing a photodiode sensor, comprising the steps of:

forming a doped well in a semiconductor substrate;

forming a shallow trench isolation (STI) element at least partially in the well;

removing a portion of the STI element to form STI regions opposing an exposed portion of the well;

forming a floating node in the exposed portion of the well, the floating node having a refractive index of greater than about 3;

forming a borderless contact buffer layer over at least the floating node and along sidewalls of the STI regions, the borderless contact buffer layer having a refractive index that is less than that of the floating node and greater than about 1.8;

forming an interlevel dielectric layer over the borderless contact buffer layer, the interlevel dielectric layer having a refractive index which is less than the borderless contact buffer layer, and greater than about 1.3;

forming a borderless contact extending through the interlevel dielectric layer and the borderless contact layer to the floating node;

whereby impinging light striking said photodiode sensor will pass through the interlevel dielectric, the borderless contact buffer layer and into the floating node, sequentially encountering materials with gradually increasing refractive indexes.

33. (new) The method of Claim 32, wherein the interlevel dielectric layer has a refractive index of between about 1.3 and about 1.5, the borderless contact buffer layer has a refractive index of between about 1.8 and about 2.5, and the floating node has a refractive index of between about 3 and about 3.4.

34. (new) The method of Claim 32 and further comprising:

forming an active CMOS device in a second well adjacent the well containing the floating node.